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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Oil and Gas Management

CFA Orphan or Abandoned Well Plugging (OAWP) Program

2017

Information for Potential CFA OAWP Grant Applicants

Presentation Objectives

- Discuss importance of well plugging

- Provide CFA Orphan and Abandoned Well Plugging (OAWP) Program background and describe DEP's role in OAWP Program process

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Presentation Outline

- Regulatory History of Well Plugging
- Risks Associated with Abandoned Wells
- Reducing Risks
- CFA OAWP Program Overview/DEP's Role in Grant Process

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History of Well Plugging and Risks Associated with Orphan and Abandoned Wells & Improperly Plugged Wells

Regulatory History of Well Plugging

- **1859** – First well drilled, “Drake well”, Titusville, PA
- **1878** – Wells first required to be plugged with wood and sediment
- **1881** – Plugging requirements updated: Fill well with sand or rock sediment and wooden plugs above third producing sand
- **1921** – Plugging requirements updated
  - Fill with sand or rock sediment and each producing strata plugged with wood plug
  - Requires venting of wells through coal layers
  - Allows for casing to be pulled with tubing and packer in place
- **1952** – API standards for cement and well plugging published
- **1956** – Well permitting begins; modern plugging requirements
- **1984** – Modern environmental plugging requirements
- **1989** – First well plugged in DEP plugging program

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Regulatory History of Well Plugging

GENERAL LAWS

PASSED BY THE

LEGISLATURE

OF THE

STATE OF PENNSYLVANIA,

DURING THE

SESSION OF 1881.

BY AUTHORITY.

No. 101.

AN ACT

Regulating the mode of plugging abandoned oil wells, and providing a penalty for the violation thereof.

Abandoned oil wells to be plugged.

SECTION 1. *Be it enacted, &c.*, That whenever any well shall have been put down for the purpose of exploring for and producing oil, upon abandoning or ceasing to operate the same, the owner or operator shall, for the purpose of excluding all fresh water from the oil-bearing rock and before drawing the casing, fill up the well with sand or rock sediment to the depth of at least twenty feet above the third sand or oil-bearing rock, and drive a round, seasoned, wooden plug at least two feet in length, equal in diameter to the diameter of the well below the casing, to a point at least five feet below the bottom of the casing, and, immediately after the drawing of the casing, shall drive a round wooden plug into the well at the point just below where the lower end of the casing shall have rested, which plug shall be at least three feet in length, tapering in form and to be of the same diameter at the distance of eighteen inches from the smaller end as the diameter of the well below the point at which it is to be driven; after it has been properly driven shall fill in on top of same with sand or rock sediment to the depth of at least five feet.

Regulatory History of Well Plugging

Risks

- Environmental/Human Health Issues:
  - Oil/Brine/Gas leaks to the environment/water sources
  - Frac Communications/Drilling Collisions
  - Problems compounded by other mineral resource production
    - Casing deterioration through interaction with acidic mine-influenced water

Defining Risk

- What can happen when an orphan or abandoned well is not properly plugged?

  Discharges of oil and/or brine to land surface or surface water, or impacts to groundwater

Defining Risk

- What can happen when an orphan or abandoned well is not properly plugged?

Communication during fracing

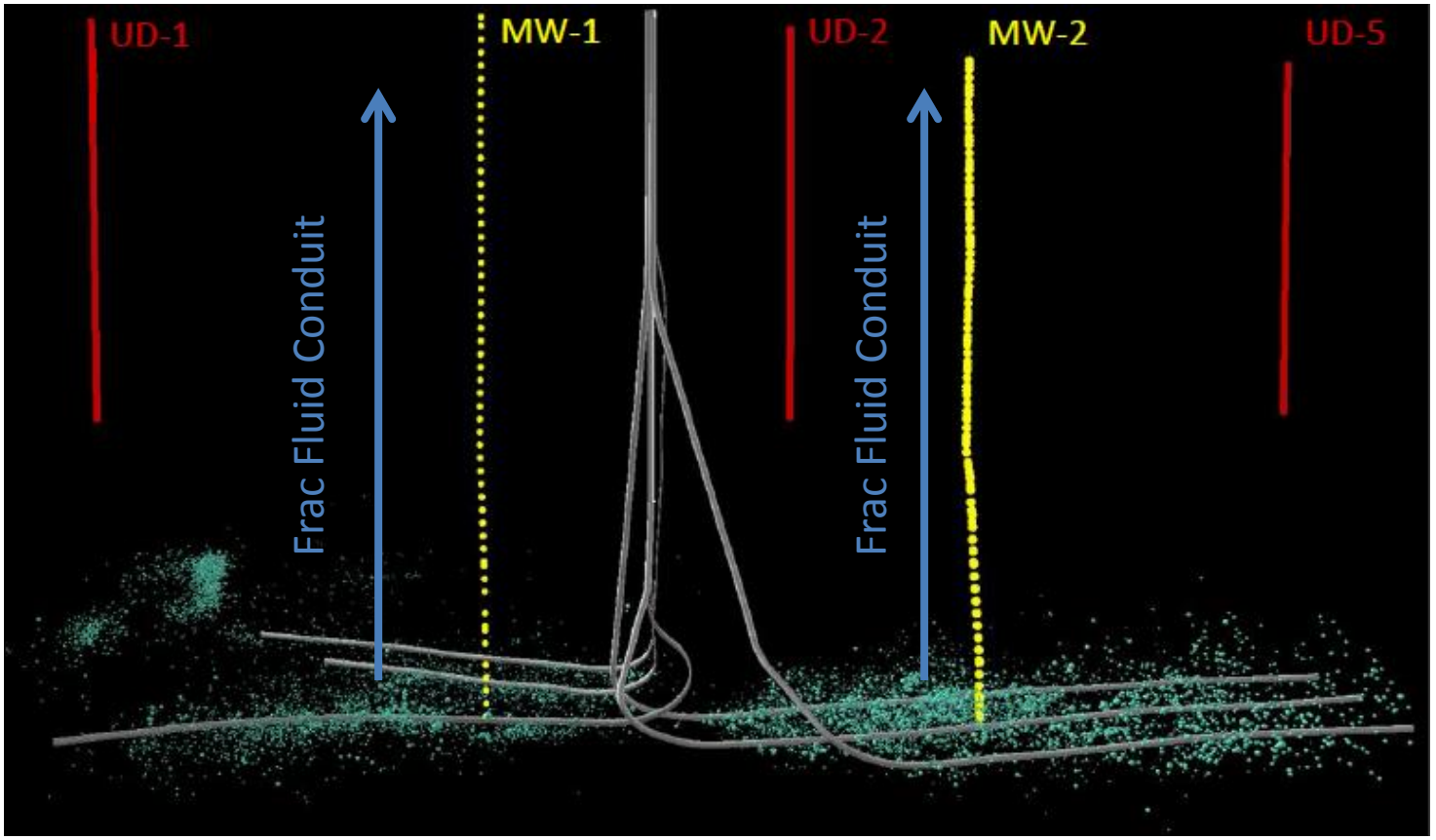


Image modified/courtesy of Richard Hammack, NETL (2014)

Defining Risk

- What can happen when an orphan or abandoned well is not properly plugged?

Communication during fracing

Risks

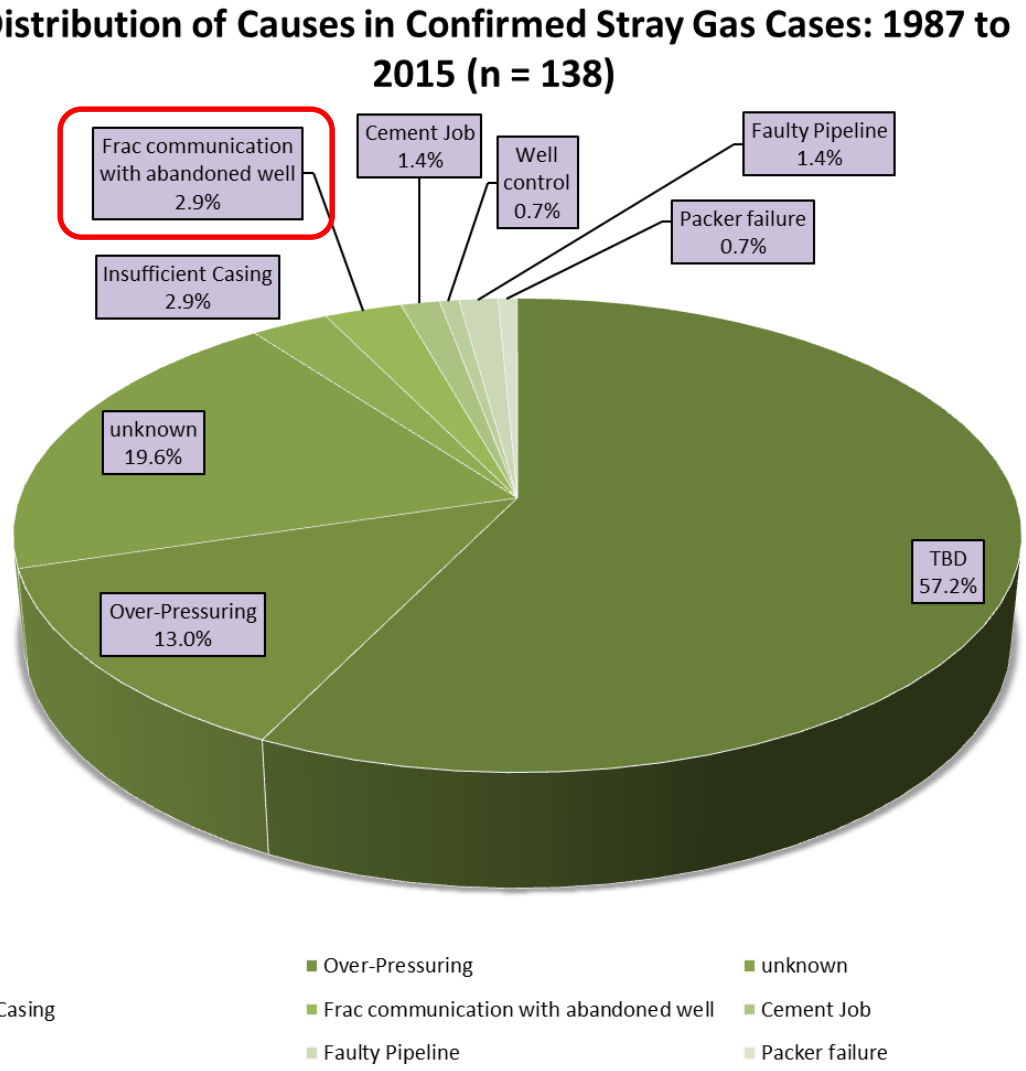
- What can happen when an orphan or abandoned well is not properly plugged?

Communication during fracing

Defining Risk

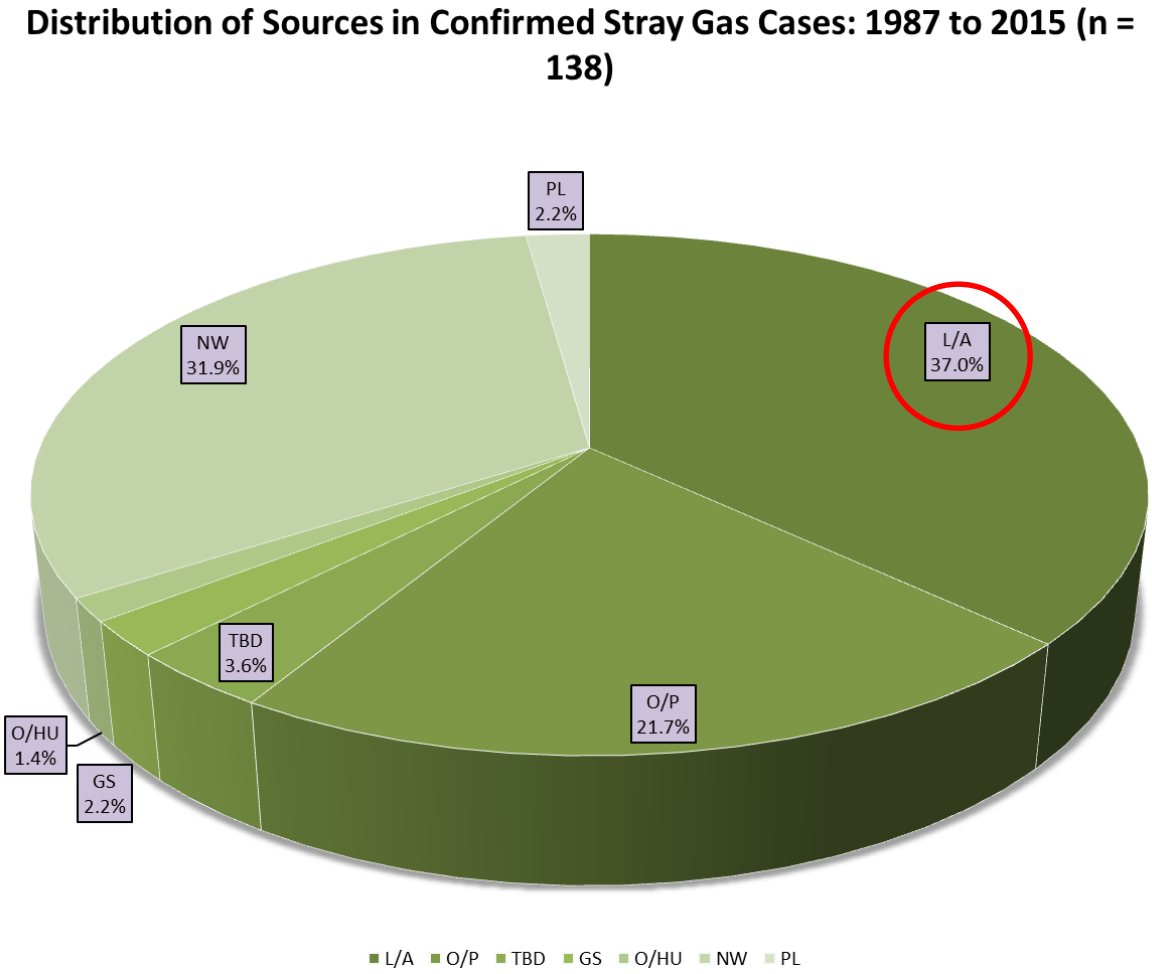
- What can happen when an orphan or abandoned well is not properly plugged?

NPR (2014)



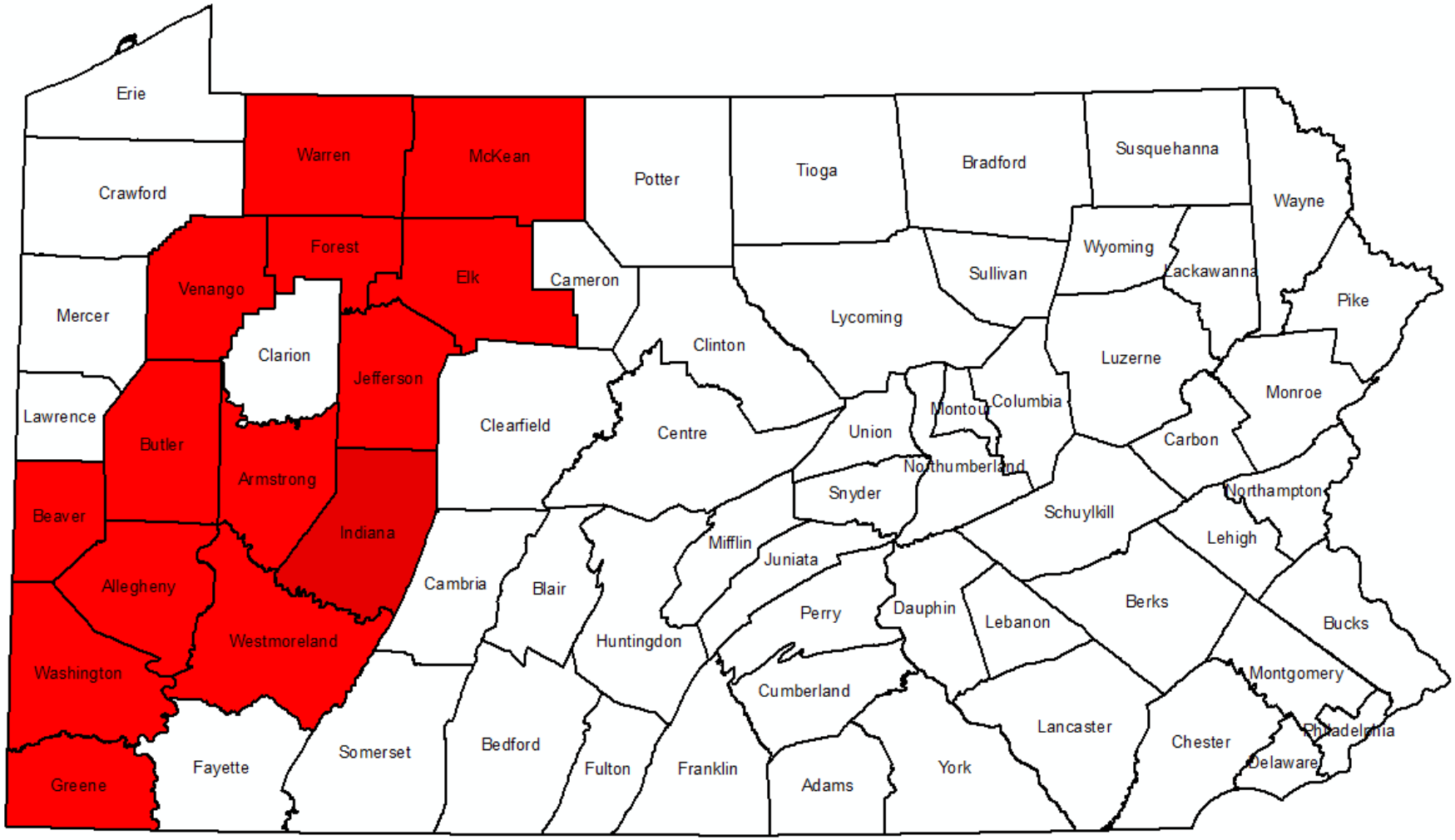
Defining Risk

- What can happen when an orphan or abandoned well is not properly plugged?
  - Approximately **37%** of confirmed stray gas migration incidents have been attributed to legacy/abandoned wells
  - Total # of water supplies affected by L/A cases 2001-2015: **55**



Defining Risk

Counties in Which Confirmed Stray Gas Incidents Were Associated with Legacy and Abandoned Wells: 1987- 2015



Defining Risk

- Example cases: Clinton County
  - In November 1998 the Department responded to a complaint of stray gas in three water supply wells. Through the course of the investigation it was discovered that because one of the affected water wells was located in the basement of a church, combustible gas migrated from the well and into the structure, causing a significant risk of explosion. It was also discovered that during a recent road resurfacing project, an abandoned gas well was paved over. The Department proceeded to remove the recent pavement and plug the abandoned well. Two of the three impacted water wells returned to normal and a marked improvement in conditions was noted at the third water well.

Defining Risk

- Example cases: Allegheny County
  - The natural gas migration problem in Versailles has been ongoing for many years. During the boom period from 1919 through 1921, over 175 wells were drilled in the Borough of Versailles, which was part of the McKeesport Gas Field. Some wells produced little or no gas and were abandoned without casing or plugging. Other wells produced for a few years and were also abandoned without plugging. During World War II, the call for scrap steel resulted in the removal of steel casings and wellheads. Wells were covered over or otherwise abandoned. Over the years many venting systems have been installed by property owners, the borough, and DEP. In 2007 and 2008, DEP let an emergency contract to rehabilitate a well on the Saraka property to relieve the natural gas pressure in the area. The DOE's National Energy Technology Laboratory (NETL) conducted an extensive study of the area. Versailles Boro has subsequently received a number of state and federal grants to investigate and mitigate the risks.

Defining Risk

- Example cases: Allegheny County
  - Stray gas was noted in residence. The source of gas is an abandoned gas well, probably located under the parking lot of the Ross Park Mall. Gas service was terminated at the house in the adjacent subdivision. Mall management staff were contacted to help locate any abandoned wells. The stray gas problem at the subdivision was mitigated by installing a venting system until the abandoned wells under the parking lot can be located.

Defining Risk

- Example cases: Washington County
  - Stray gas was encountered in soils adjacent to a business. The origin/mechanism of migration is an abandoned gas well. Gas was leaking from the well in the parking lot and has been found adjacent to the building's slab foundation. DEP issued a contract to plug the well and initially vented the well until plugging work could commence. Plugging was recently completed.

Defining Risks

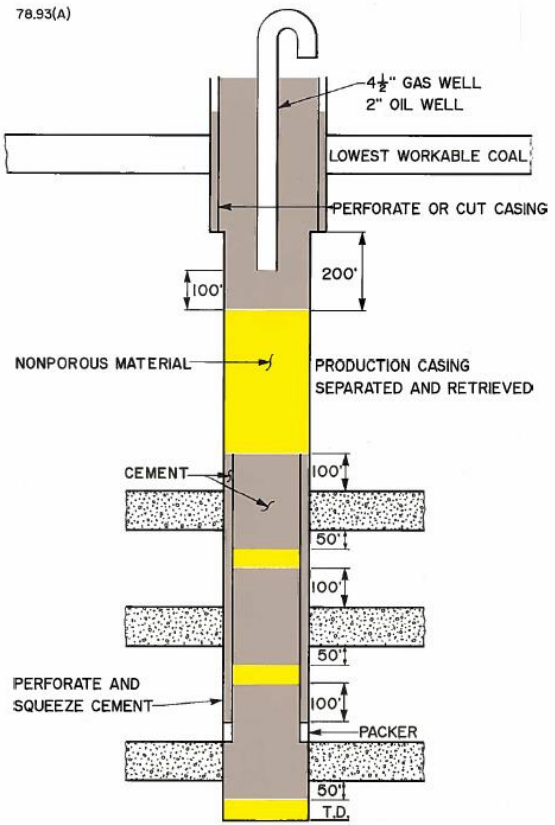
Risks associated with Abandoned, Orphan, and improperly Plugged wells can be compounded by mine-influenced water in areas of coal mining

Defining Risks

- Failed and Improperly Plugged Wells
  - Gas migration is the result and has the potential to be a serious public safety issue
  - Improperly plugged wells are a significant financial liability for Pennsylvania
  - The number of plugged wells will grow in time, but plugging does not always represent the last chapter in a well's life

Reducing Risks

- Risks associated with abandoned and orphan wells can be reduced through proper plugging
- Interim procedures such as well venting are also effective mitigation strategies
- In cases where wells cannot be located in the field, treatment at the source through the installation of mitigation systems also provides protection of public safety



Conclusion

- Regulatory requirements for well plugging have evolved over time
- Wells plugged prior to modern plugging requirements may still pose a risk to human health and environment
- Abandoned / orphan /improperly plugged wells can and have caused impacts to the environment and human health
- Locational inaccuracies increase liability
- The longer an abandoned wells sits, the more likely it is going to cause a problem; and it is highly probable it will cost more money to plug it

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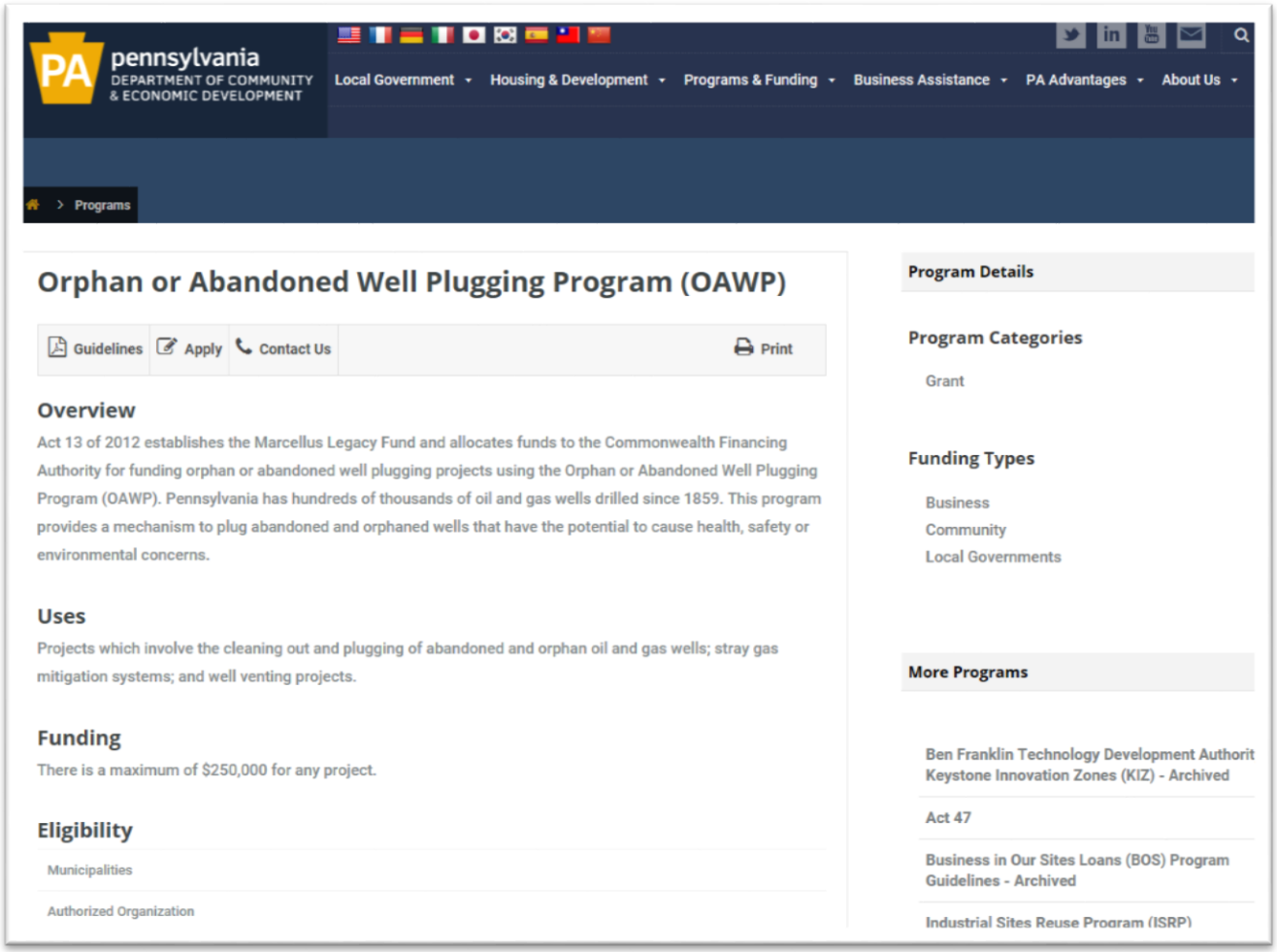
CFA OAWP Program

CFA OAWP Program

http://community.newpa.com/programs/orphan-abandoned-well-plugging-program-oawp/



CFA OAWP Program Summary

Grant source: Act 13 Marcellus Legacy Fund

Eligible projects: well plugging/stray gas mitigation systems/well venting

Application period: February 1st – May 31st

Maximum grant level: $250,000 per project

Grant processing fee: $100

Applicant cost sharing: "eligible applicant shall provide easements and rights-of-way, and landowner commitments"

Grant period: up to 3 years

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CFA OAWP Eligible Applicants

- Eligible applicants:
  - Municipalities
  - Councils of Government
  - Non-Profits
  - Colleges/Universities
  - Watershed Organizations
  - For-Profit Businesses

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CFA OAWP Eligible Applicants

- Eligibility Caveats:
  - Watershed Organizations
    - DEP-recognized watershed organizations must be incorporated
    - DCNR-recognized watershed organizations must have a primary mission of river conservation and 501 (c)(3) status, and must be established under Pennsylvania law, authorized to do business in the Commonwealth and Registered with the Commonwealth's Bureau of charitable organizations
    - For more information visit pawatersheds.org

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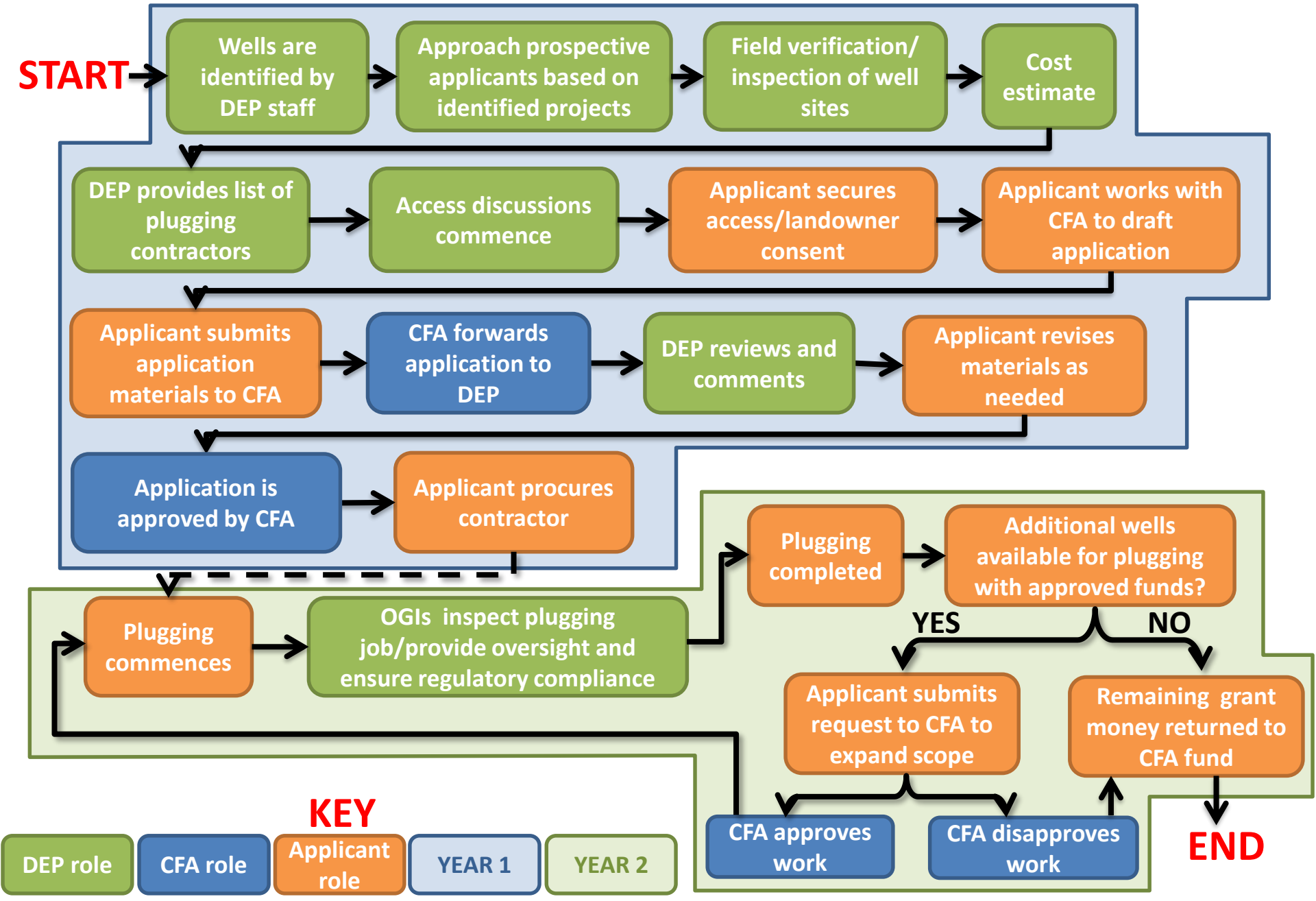
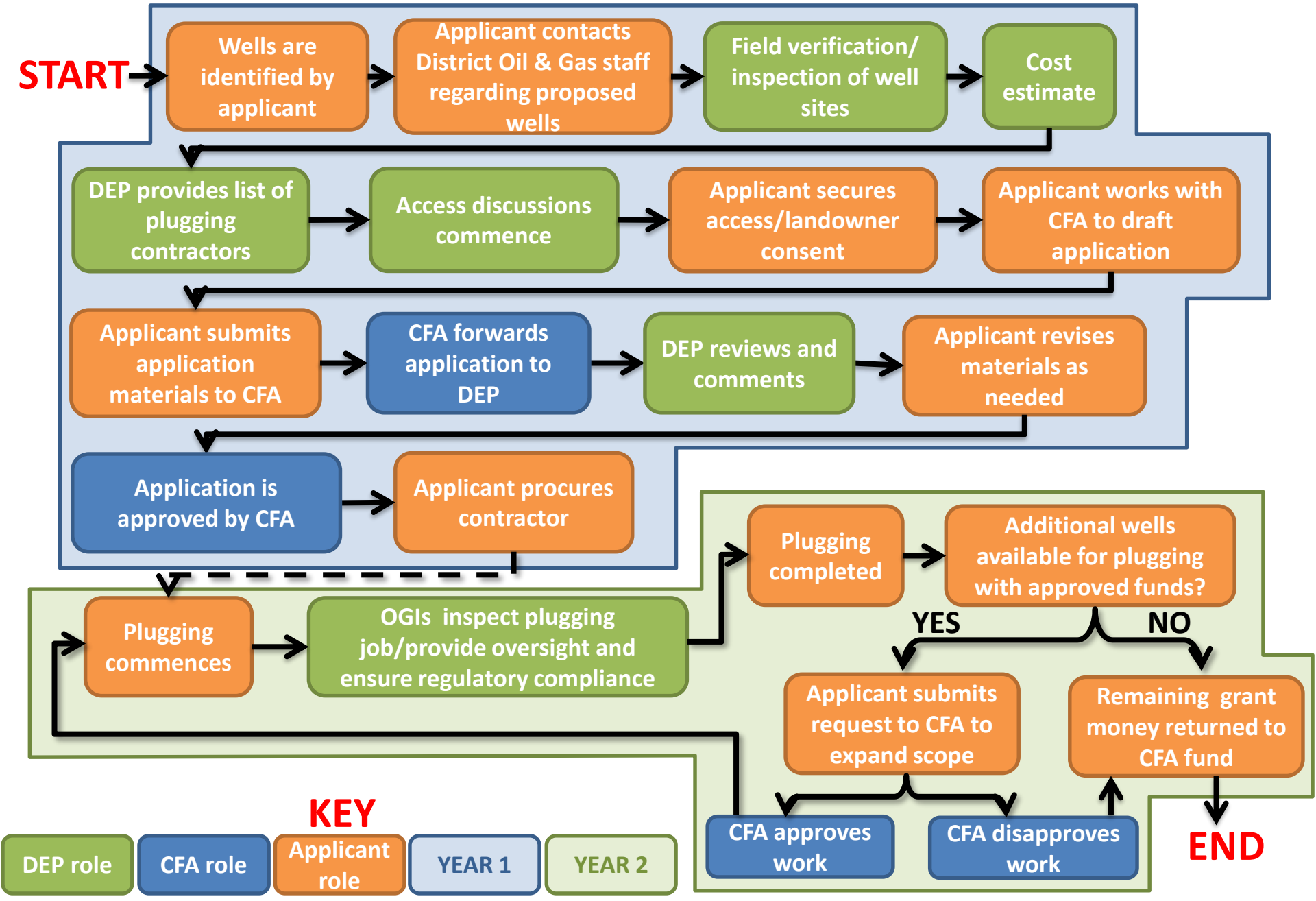
CFA OAWP Eligible Applicants

- Eligibility Caveats:
  - For-Profit Businesses
    - Companies who specialize in plugging are not eligible to complete work that is part of a grant package they submitted

CFA OWAP Grant Process Flow Diagram: DEP Initiated



CFA OWAP Grant Process Flow Diagram: 3rd Party Initiated



DEP Role – "The Middleman"

- Provide outreach and education (Central Office/Districts along with CFA Office)
- Communicate eligible wells/projects to grantees (Central Office/Districts)
- **Assist with grant application process (Central Office/Districts along with CFA Office)**
  - Field checks/access negotiations/cost estimates (Districts)
  - Make available list of DEP approved contractors (Central Office)
- Review submitted applications and recommend any necessary modifications (Central Office/Districts)
- Plugging inspections (Districts)

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Applicant Liability Protection

- Applicants may also choose to submit a Good Samaritan Law application to the Department of Environmental Protection (DEP), which protects landowners, groups and individuals who volunteer to do environmental reclamation projects from civil and environmental liability.

- For more information, please visit DEP's website at www.dep.state.pa.us, Keyword: "Reclaim PA."

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Applicant Liability Protection

- Eligible Good Samaritan applicants include:
  - Landowners who provide access to the project site without compensation
  - Individuals, corporations, non-profit organizations, and government entities whom:
    - Provide equipment, materials or services for the project for no profit;
    - Did not cause or create the abandoned mineral extraction land or water pollution;
    - Were not ordered by the state or federal government to do the work;
    - Are not performing the work under a contract for profit, such as a competitive bid project or a Government-Financed Construction Contract; and
    - Are not the surety that issued the bond for the site.

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CFA OAWP Process

- Determining project costs
  - DEP Oil and Gas staff are able to provide plugging cost estimates
  - Estimates may also be provided by plugging operators
- Site access must be secured prior to grant application submittal
- The applicant must seek competitive bids for the project, although a project may continue even when only a single bid is received

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CFA OAWP Process

- Administration costs are capped at 2% of the total grant amount
- Applicants may request up to an additional 5% to cover contingency costs
- Projects must be completed within the timeframe agreed upon in the proposal and may not exceed 3 years

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CFA OAWP Process

- Fund distribution
  - Applicant submits a payment request every 30 days
  - The applicant can either pay the contractor and list “PAID” on the payment request form or list “Cost Incurred” on the form
  - Reimbursement from the CFA typically occurs within a week

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CFA OAWP Application Requirements

- Applicants must complete the Department of Community and Economic Development Single Application for Assistance
- Eleven exhibits must be submitted along with the application – these are detailed in the slides that follow

CFA OAWP Application Requirements

- **Exhibit 1:** A project narrative inclusive of the following information: a detailed map; historical information justifying the need for the project; the number of homes, individuals, businesses, and/or industrial sites that will benefit from the project; the scope of work and cost-effectiveness of the project.
- **Exhibit 2:** A well data sheet that includes: API number (if known), well operator (if known), well farm name, 7 1/2” U.S.G.S. topographic map location, directions to the well, well location, well casing strings as noted/measured at the surface, and well condition.

CFA OAWP Application Requirements

- **Exhibit 3:** A detailed construction cost estimate depicted as a Schedule of Unit Prices showing the breakdown of itemized quantities and prices, prepared by an engineer or other qualified professional.
- **Exhibit 4:** A set of construction drawings showing project details including but not limited to plans, profiles, payment section, structural details, erosion and sedimentation control plan, and miscellaneous details.

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CFA OAWP Application Requirements

- **Exhibit 5:** List of all state, federal, and local planning and permit approvals that will be needed.
- **Exhibit 6:** Funding commitment letters from all other project funding sources **if applicable** (including equity commitments). Letters should include the term, rate, and collateral conditions and must be signed and dated.
- **Exhibit 7:** The most recent financial statements of the applicant including balance sheets, income statements and notes to financials.

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CFA OAWP Application Requirements

- **Exhibit 8:** A statement detailing the amount of grant funding requested.
- **Exhibit 9: For public sector applicants only**, a resolution duly adopted by the applicant's governing board formally requesting the grant, designating an official to execute all documents, describing briefly the project scope, and identifying the grant amount.
- **Exhibit 10:** Copies of notifications provided to county and municipal governing bodies advising them of the proposed project.
- **Exhibit 11:** A listing of all oil and gas well plugging experience.

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Summary

- Regulatory requirements for well plugging have evolved over time
- Abandoned, orphan, and improperly plugged wells pose many risks to human health and environment and, in some cases, render land unusable for development or occupation
- Grant opportunities through the CFA are available for the mitigation of these risks
- DEP Oil and Gas staff are dedicated to assisting potential applicants

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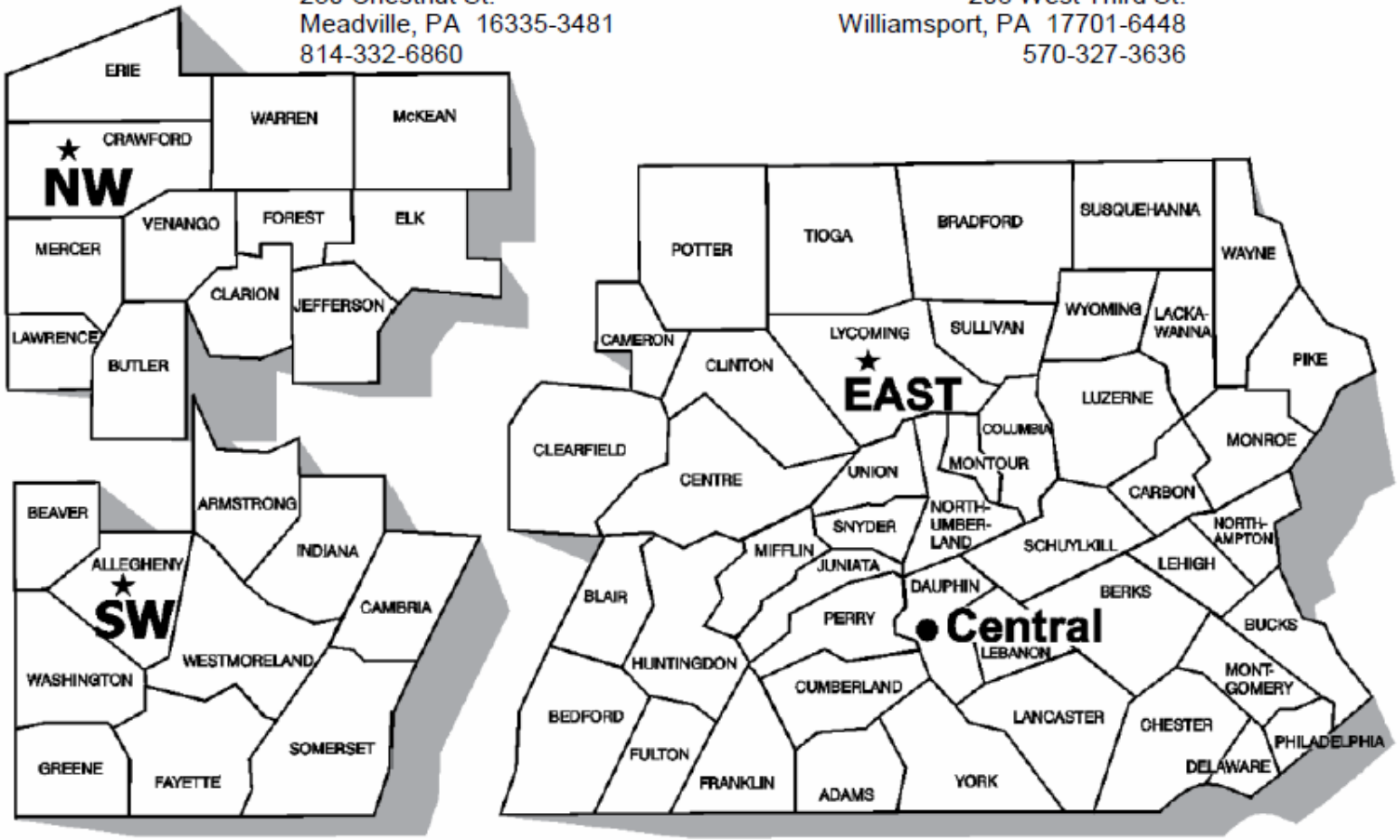
Oil and Gas Districts

★ Northwest District

230 Chestnut St.
Meadville, PA 16335-3481
814-332-6860

★ Eastern District

208 West Third St.
Williamsport, PA 17701-6448
570-327-3636



★ Southwest District

400 Waterfront Drive
Pittsburgh, PA 15222-4745
412-442-4024

● Central Office

Bureau of Oil and Gas Planning and Program Management
P.O. Box 8765
Harrisburg, PA 17105-8765
717-772-2199

Questions/Concerns?

Thank you!

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Well Plugging and Subsurface Activities Division

717.772.2199

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